The Regenstrief Medical Record System - Experience with MD Order Entry and Community-wide Extensions

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Abstract:

The Regenstrief Medical Record System (RMRS) encompasses three hospitals on the Indiana University Medical Center campus, all of their clinics, and thirty off-campus clinic sites. It captures data for about 60,000 hospitalizations and 600,000 outpatient encounters per year. At present, over 800,000 patients and nearly 100,000,000 separate observations are carried by RMRS.

We have been deliberately opportunistic in the capture of clinical data. We capture laboratory and medication information from three different laboratory and pharmacy systems; vital signs and nursing observations from automated bedside machines (Vital Net) on one inpatient service; full text admission, discharge and visit notes, and surgical pathology, radiology, and nuclear medicine reports from three different dictation systems; EKG tracings and diagnoses from EKG carts; and registration and transfer information from three different ADT systems. We use HL7 as our principal message standard for linking these systems. We also capture a varying amount of fully coded patient information from patient- and clinic - specific encounter forms, and we code and record the diagnostic impressions from all diagnostic studies.

The medical records room tracks charts, enters case abstract information, and tracks chart completion through the system. When discharge dictations and operative notes are transcribed, the system notes that fact and alerts the physician to the need to electronically sign the report. As patients are admitted, the computer sends notice to the attending physician.

Researchers and managers can retrieve patients from the medical records system, based on the value of coded and numeric results, in seconds to minutes (depending upon the query). Raw text data can also be searched but the process is much slower.

At Wishard, where the system has been installed the longest, the computer contains everything but the provider's handwritten notes. Medicine service physicians enter all of their orders (inpatient and outpatient) directly into the computer order entry system. Surgery physicians enter all inpatient orders. The order entry system provides problem oriented order prompting; access to medical text book information; pocket rounds reports; warnings about allergies, drug and diagnosis interactions; and reminders about blocking conditions, consequent orders, and preventive care, triggered by rule-based guidelines.

The computer scans all laboratory results and vital signs as they are entered, looking for critically abnormal values. Any such results are transmitted directly to the physician via a pager with a 4x20 character LCD display.

In the homeless clinics the computer maintains the entire patient record and generates patient education sheets related to the patient's problem.

We have extended the system to thirteen mental health clinics, four HMO offices, ten community-based clinics, a number of homeless care sites, and two elderly care facilities located between one and eight miles from Wishard Hospital. Currently we are upgrading and expanding these links. We will add lines to the emergency rooms of two more hospitals (Methodist and Community East) and convert to Ethernet links over cable TV lines. We are developing interfaces to community pharmacy systems so physicians can obtain complete drug profiles on their patients and determine whether patients are complying with their medication orders.

We will demonstrate all components of this system.

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